

**Amendments to the Claims:**

This listing of claims will replace all prior versions and listings of claims in the application:

**Listing of Claims:**

- 1 (currently amended): A method for symbol timing synchronization in an orthogonal  
5 frequency division multiplexing (OFDM) communication system, the method  
comprising:
- (a) converting a time domain digital signal to a corresponding frequency domain  
digital signal;
  - (b) calculating phase angles of tones of at least one symbol of the frequency  
10 domain digital signal when a symbol timing offset exists;
  - (c) calculating at least one differential phase offset (DPO), which is the difference  
between two consecutive gaps, wherein a gap is the difference between the  
phase angle of a tone of the symbol of the frequency domain digital signal  
when the timing offset of the symbol exists and a correct phase angle of the  
15 tone of the symbol of the frequency domain digital signal; and
  - (d) estimating the symbol timing offset ~~with at least one DPO~~ utilizing a  
histogram of a group of DPOs, wherein the histogram is obtained by  
dividing the interval 0 to  $2\pi$  into a plurality of sub intervals, and counting  
the number of DPOs that fall into each sub interval.
- 20
- 2 (original): The method of claim 1 further comprising removing a cyclic prefix and/or  
suffix from between contiguous symbols before converting the time domain digital  
signal to the corresponding frequency domain digital signal.
- 25 3 (original): The method of claim 1 wherein the calculations of the gaps and the DPOs are  
performed with mod  $2\pi$  arithmetic, the values of the gaps and the DPOs being within  
the range of 0 to  $2\pi$ .

4 (currently amended): The method of claim 1 wherein estimating the symbol timing offset comprises utilizing ~~a mean~~ a mean of a group of DPOs.

5 5 (currently amended): The method of claim 1 wherein estimating the symbol timing offset comprises utilizing a ~~median of~~ median of a group of DPOs.

6-7 (cancelled).

10 ~~8~~ <sup>6</sup> (currently amended): The method of ~~claim 7~~ claim 1 wherein utilizing the histogram to estimate the symbol timing offset further comprises selecting a median of the range represented by the sub interval that the most DPOs fall into as the symbol timing offset.

15 ~~9~~ <sup>7</sup> (currently amended): The method of ~~claim 7~~ claim 1 wherein the sizes of each sub interval are equal.

18 ~~10~~ <sup>8</sup> (currently amended): A symbol timing synchronization system for an orthogonal frequency division multiplexing (OFDM) communication system, the symbol timing synchronization system comprising:

20 a serial-to-parallel converter ~~capable of~~ for performing serial-to-parallel conversion on an input time domain digital signal;

a fast Fourier transform (FFT) module electrically connected to the serial-to-parallel converter for transforming the time domain digital signal into a frequency domain digital signal; and

25 a demodulator electrically connected to the FFT module comprising:

a symbol timing offset estimator comprising:

a phase calculator electrically connected to the FFT module for calculating phase angles of tones of at least one symbol of the

frequency domain digital signal output from the FFT module  
when a symbol timing offset exists;

a phase offset calculator electrically connected to the phase calculator  
for calculating at least one differential phase offset (DPO), which  
is the difference between two consecutive gaps, wherein a gap is  
the difference between the phase angle of a tone of the symbol of  
the frequency domain digital signal when the timing offset of the  
symbol exists and a correct phase angle of the tone of the symbol  
of the frequency domain digital signal; and

an estimating module electrically connected to the phase offset  
calculator ~~capable of for~~ utilizing the ~~at least one DPO to~~  
~~estimate the symbol timing offset~~ a histogram of a group of  
DPOs, wherein the histogram is obtained by dividing the interval  
0 to  $2\pi$  into a plurality of sub intervals, and counting the  
number of DPOs that fall into each sub interval; and

a demodulation module for demodulating the frequency domain digital  
signal.

11 (currently amended): The symbol timing synchronization system in claim 10 wherein  
the estimating module ~~is capable of calculating~~ calculates a mean of a group of DPOs  
and ~~utilizing~~ utilizes the mean to estimate the symbol timing offset.

12 (currently amended): The symbol timing synchronization system in claim 10 wherein  
the estimating module ~~is capable of calculating~~ calculates a median of a group of  
DPOs and ~~utilizing~~ utilizes the median to estimate the symbol timing offset.

13 (cancelled).

11  
14 (currently amended): The symbol timing synchronization system in claim 10 wherein  
the serial-to-parallel converter ~~is capable of removing~~ removes a prefix and/or suffix  
from between symbols. 8

12  
5 15 (new): The symbol timing synchronization system in claim 10 wherein the estimating  
module utilizes the histogram to estimate the symbol timing offset by selecting a  
median of the range represented by the sub interval that the most DPOs fall into as the  
symbol timing offset. 6

13  
10 16 (new): The symbol timing synchronization system in claim 10 wherein the sizes of  
each sub interval are equal. 8